

# PATENT COOPERATION TREATY

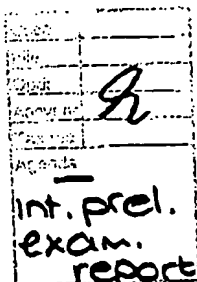
From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

12 JAN 2004

PCT

To:

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## NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing  
(day/month/year) 09.01.2004

Applicant's or agent's file reference  
C/2AD17/SK/1

### IMPORTANT NOTIFICATION

International application No.  
PCT/EP 03/02303

International filing date (day/month/year)  
05.03.2003

Priority date (day/month/year)  
05.03.2002

Applicant  
STATOIL ASA et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international  
preliminary examining authority:



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# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

**REC'D 12 JAN 2004**

**WIPO PAT**

Applicant's or agent's file reference <b>C/2AD17/SK/1</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. <b>PCT/EP 03/02303</b>	International filing date (day/month/year) <b>05.03.2003</b>	Priority date (day/month/year) <b>05.03.2002</b>
International Patent Classification (IPC) or both national classification and IPC <b>B01D45/08</b>		
Applicant <b>STATOIL ASA et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>07.08.2003</b>	Date of completion of this report  <b>09.01.2004</b>
Name and mailing address of the International preliminary examining authority:   <b>European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016</b>	Authorized Officer  <b>Bogaerts, M</b>  Telephone No. +31 70 340-2335  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/02303

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-19 received on 07.08.2003 with letter of 31.07.2003

**Drawings, Sheets**

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP 03/02303**

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-19
	No: Claims	
Inventive step (IS)	Yes: Claims	1-19
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/EP03/02303

**Ad V:**

Reference is made to the following documents:

D1: EP-A-0195464  
D2: WO-A-0074815  
D3: US-A-6251168  
D4: US-A-3010537

The subject-matter of independent claim 1 differs from the prior art documents (D1 and D3) in particular in that means for collecting droplets which have broken through the agglomerating unit and means for recycling the collected liquid from the collecting means are provided.

The subject-matter of claim 1 is thus new.

Drainage of the coalescer takes place, thus enhancing the capacity of the separation device.

The incorporation of such a drainage into the devices of D1 and D3 is neither suggested nor obvious from any of the available prior art documents.

Novelty and inventive step should therefore be acknowledged.

The same arguments apply to the independent method claim 13.

The application meets the requirements of Art. 33 PCT.

**Remarks as to clarity:**

The category of claim 19 is not clear ("device or method").

The numbering of the figures in the description does not correspond with the numbering of the figures.

international patent application PCT/EP03/02303

Encl. to letter dated 31 July 2003

EPO - DG 1

CLAIMS

C 7. C 8. 2003



1. Device for treating a gas/liquid mixture,  
comprising:

- an upright vessel with a lower and upper  
compartment;

- an inlet for admitting the flow of mixture into the  
lower compartment;

- an agglomerating unit placed between the lower and  
upper compartment for enlarging the liquid droplets in the  
mixture;

- a separator arranged in the upper compartment  
downstream of the agglomerating unit for further separating  
the mixture into a substantially liquid-containing mixture  
part and a substantially gas-containing mixture part.

- a lower outlet for discharging the substantially  
liquid-containing mixture part from the lower compartment;

- an upper outlet for discharging the substantially  
gas-containing mixture part from the upper compartment;

characterized by

- collecting means for collecting in or downstream  
the agglomerating unit the liquid droplets which have broken  
through the agglomerating unit;

- recycling means for recycling the collected liquid  
from the collecting means to the lower compartment.

2. Device for treating a gas/liquid mixture,

comprising:

- an upright vessel with a lower and upper compartment;

- an inlet for admitting the flow of mixture into the  
lower compartment;

- an agglomerating unit placed between the lower and upper compartment for enlarging the liquid droplets in the mixture;

- a lower outlet for discharging the substantially  
5 liquid-containing mixture part from the lower compartment;

- an upper outlet for discharging the substantially gas-containing mixture part from the upper compartment;

characterized by

- collecting means for collecting on the downstream side  
10 of the agglomerating unit liquid droplets which have broken through the agglomerating unit;

- recycling means for recycling the collected liquid to the lower compartment from the collecting means.

3. Device according to claim 1 or 2, wherein the  
15 agglomerating unit comprises a wire mesh.

4. Device as claimed in any of the claims 1-3, wherein the collecting means comprise at least one collecting reservoir extending in the agglomerating unit for collecting the broken-through liquid therein, and wherein recycling  
20 means comprise a discharge conduit extending from the collecting reservoir to below the level of the liquid collected in the lower compartment.

5. Device as claimed in claim 1 or 2, wherein the collecting means are arranged over substantially 15% of the  
25 cross-section of the vessel.

6. Device as claimed in either of the foregoing claims 3-5, wherein the mesh is embodied to allow the supplied liquid to break through from a minimum K-value of about 0.1.

30 7. Device as claimed in any of the foregoing claims, wherein the agglomerating unit extends substantially horizontally.

8. Device as claimed in any of the foregoing claims, wherein the agglomerating unit extends over substantially the whole cross-section of the upright column.

9. Device as claimed in any of the foregoing claims,  
5 wherein the thickness of the agglomerating unit is substantially constant.

10. Device as claimed in claim 1, wherein the separator comprises one or more cyclone separators.

11. Device as claimed in claim 1 or 10, wherein the  
10 separator comprises one or more axial recycle cyclones, the liquid discharge of which extends from the separator to below the liquid level in the lower compartment.

12. Device as claimed in any of the foregoing claims, wherein the inlet is connected to a pre-treatment unit for  
15 carrying out a first liquid/gas separation, which pre-treatment unit comprises an inlet cyclone separator arranged in the lower compartment.

13. Method for treating a gas/liquid mixture in an upright vessel with a lower and upper compartment, comprising  
20 of:

- feeding the gas/liquid flow into the lower compartment of the column;

- guiding the gas/liquid flow through an agglomerating unit arranged between the lower and upper  
25 compartment at high speed such that liquid breaks through to a position beyond the downstream surface of the agglomerating unit;

- collecting the broken-through liquid;

- recycling the collected liquid to the lower  
30 compartment;

- guiding the mixture through a separator in the upper compartment for further separating the mixture into a



substantially liquid-containing mixture part and a substantially gas-containing mixture part;

- discharging the mixture from the lower compartment and discharging the mixture from the upper compartment.

5           14. Method for treating a gas/liquid mixture in an upright vessel with a lower and upper compartment, comprising of:

- feeding the gas/liquid flow into the lower compartment of the column;

10           - guiding the gas/liquid flow through an agglomerating unit arranged between the lower and upper compartment at high speed such that liquid breaks through to a position beyond the downstream surface of the agglomerating unit;

15           - collecting the broken-through liquid;  
- recycling the collected liquid to the lower compartment;

- discharging the mixture from the lower compartment;  
- discharging the mixture from the upper compartment.

20           15. Method as claimed in claim 13 or 14, wherein the K-value of the supplied mixture amounts to at least 0.1.

          16. Method as claimed in claim 13, 14 or 15, comprising of further separating the mixture in the upper compartment by guiding the mixture through one or more  
25 cyclone separators and carrying the separated liquid part to the lower compartment and the separated gas part to the upper outlet.

          17. Method as claimed in any of the claims 13-16, comprising of pre-treating the introduced gas/liquid flow for  
30 separating a part of the liquid from the gas/liquid mixture, wherein the pretreatment comprises of guiding the introduced gas/liquid mixture through one or more inlet cyclones.

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18. Method as claimed in any of the claims 13-17, to be performed in a device as claimed in any of the claims 1-12.

19. Device or method as claimed in any of the foregoing claims, wherein the liquid contains oil and/or water.